

## CLAIMS

What is claimed is:

1. A noise absorption assembly comprising;  
5 a first layer including a mixture of first fibers having a first melting temperature and second fibers having a second melting temperature greater than said first melting temperature with said first fibers interwoven with said second fibers,  
a second layer, and  
said first fibers fused to said second layer for holding said first layer to  
10 said second layer while maintaining said second fibers free of said second layer.
2. An assembly as set forth in claim 1 wherein said second fibers are more flexible than said first fibers.
- 15 3. An assembly as set forth in claim 1 wherein said first layer has a larger areal mass than said second layer.
4. An assembly as set forth in claim 3 wherein said second layer has an areal mass in the range of  $90 \text{ g/m}^2$  to  $110 \text{ g/m}^2$ .  
20
5. An assembly as set forth in claim 3 wherein said first layer has an areal mass in the range of  $430 \text{ g/m}^2$  to  $1290 \text{ g/m}^2$ .
6. An assembly as set forth in claim 5 wherein said first layer has an areal  
25 mass in the range of  $430 \text{ g/m}^2$  to  $645 \text{ g/m}^2$ .
7. An assembly as set forth in claim 1 wherein said first and said second fibers are polyester.
- 30 8. An assembly as set forth in claim 1 wherein said first layer has a thickness in the range of 20 mm 35 mm.

9. An assembly as set forth in claim 1 wherein said second layer has an airflow resistivity in the range of  $700 \text{ Rn/m}^3$  to  $800 \text{ Rn/m}^3$ .

10. An assembly as set forth in claim 1 wherein said second layer is  
5 formed from a non-woven mixture of polyester and rayon.

11. An assembly as set forth in claim 1 wherein said second layer has a thickness in the range of 0.5 mm to 2.0 mm.

10 12. An assembly as set forth in claim 1 further including a scrim layer adhered to said first layer.

13. An assembly as set forth in claim 12 wherein said first fibers are fused to said scrim layer for holding said first layer to said scrim layer while maintaining  
15 said second fibers free of said second layer.

14. An assembly as set forth in claim 1 further including a third layer adhered to one of said first or said second layers.

20 15. An assembly as set forth in claim 14 wherein said third layer is comprised of closed-cell foam.

16. A method of making a noise absorption assembly, having a first layer including a mixture of first fibers with a first melting temperature and second fibers  
25 with a second melting temperature greater than the first melting temperature and a second layer including the steps of;

overlaying the first layer onto the second layer to form a sub-assembly  
and

melting the first fibers of the first layer by raising the temperature of  
30 the sub-assembly to a bonding temperature between the first and the second temperatures to fuse the first fibers to the second layer without melting the second fibers.

17. A method as set forth in claim 16 wherein the step of melting further includes the step of curing the first fibers to a state more rigid than said second fibers.

18. A method as set forth in claim 17 wherein the step of curing is further  
5 defined as chilling the sub-assembly to solidify the first fibers.

19. A method as set forth in claim 18 further including the step of applying a scrim layer over the first layer.

20. A method as set forth in claim 16 further including the step of inserting  
10 the sub-assembly into a press.

21. A method as set forth in claim 20 further including the step of  
compressing the sub-assembly in the press to form a three-dimensional assembly.  
15

22. A method as set forth in claim 21 further including the step of piercing the sub-assembly to form holes in the assembly.

23. A noise absorption assembly comprising:  
20 a first layer formed from a polymeric fibrous material including a mixture of first fibers having a first melting temperature and second fibers having a second melting temperature greater than said first melting temperature with said first fibers interwoven with said second fibers for absorbing the transmission of sound; and  
a second layer formed from a non-woven polymeric material and  
25 adhered on said first layer with said second layer being generally imperforate for providing a barrier to prevent the transmission of sound.

24. An assembly as set forth in claim 23 wherein said first layer has a thickness in the range of 20 mm to 30 mm.

25. An assembly as set forth in claim 23 wherein said second layer has an  
30 airflow resistivity in the range of 700 Rn/m<sup>3</sup> to 800 Rn/m<sup>3</sup>.

26. An assembly as set forth in claim 23 wherein said second layer has a thickness in the range of 0.5 mm to 2.0 mm.

27. An assembly as set forth in claim 23 wherein said polymeric fibrous  
5 material of said first layer is polyester.

28. An assembly as set forth in claim 23 wherein said non-woven polymeric material of said second layer is rayon and polyester.

10 29. An assembly as set forth in claim 23 wherein said first layer has a larger areal mass than said second layer.

30. An assembly as set forth in claim 29 wherein said second layer has an areal mass in the range of  $90 \text{ g/m}^2$  to  $110 \text{ g/m}^2$ .  
15

31. An assembly as set forth in claim 29 wherein said first layer has an areal mass in the range of  $430 \text{ g/m}^2$  to  $1290 \text{ g/m}^2$ .

32. An assembly as set forth in claim 31 wherein said first layer has  
20 an areal mass in the range of  $430 \text{ g/m}^2$  to  $645 \text{ g/m}^2$ .